Regulatory Advisory

November 2008,

TRU Advisory: 08-14
Using GTL Synthetic Diesel Fuel as a TRU ATCM Compliance Option

The purpose of this advisory is to explain how Gas-to-Liquid (GTL) synthetic diesel fuel may be used to comply with the TRU ATCM once it is verified as a diesel emission control strategy and discuss some of the issues related to its use.

Background

The Transport Refrigeration Unit (TRU) Airborne Toxic Control Measure (ATCM) (title 13 California Code of Regulations (13 CCR), section 2477) requires owners to bring their TRU and/or TRU generator set[1] (genset) engines into compliance with in-use performance standards. There are two levels of stringency for these in-use performance standards. The Low-Emission TRU In-Use Performance Standard (LETRU) reduces diesel particulate matter (PM) by at least 50 percent. The Ultra-Low-Emission TRU In-Use Performance Standard (ULETRU) reduces diesel PM by at least 85 percent. In-use performance standard compliance dates are phased in, based on the engine model year (MY), as shown in Table 1.

Table 1
In-Use Performance Standard Compliance Dates

MY	LETRU	ULETRU
2001 and older	December 31, 2008	December 31, 2015
2002	December 31, 2009	December 31, 2016
2003	Not Applicable	December 31, 2010
2004 and subsequent	Not Applicable	December 31st of 7th year after MY

Alternative Technologies can be used to meet the LETRU and ULETRU In-Use Performance Standards if diesel PM emissions are eliminated while at a facility (ref. 13 CCR section 2477 (e)(1)(A)3.) Subparagraph (e)(1)(A)3.d. allows compliance to be achieved if the TRU is fueled exclusively with an alternative diesel fuel, such as ultra-low-aromatic synthetic diesel fuel (more commonly called GTL fuel), in accordance with the requirements of subsection (e)(2)(A), which are as follows:

1. Maintain records of alternative diesel fuel use in accordance with 13 CCR, §2477, subsection (f)(1)(B) to show the TRU uses only the chosen alternative diesel fuel for all operations in California.[2]
2. Use only fuel that has been verified as a VDECS[3] alternative diesel fuel that contains no conventional diesel or CARB diesel fuel[4] in TRUs operated in California.

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[1] Hereinafter, the use of the term TRU also indicates TRU generator sets, unless otherwise specified.
[2] For example, the TRU must be fueled exclusively with GTL fuel.
[3] VDECS stands for verified diesel emission control strategy.
[4] For example 100 percent GTL fuel (GTL100).

3. Permanently affix a label in clear view near the fuel tank fill spout that identifies the proper fuel that is required to be in compliance with the TRU ATCM (e.g. FUEL with GTL100 ONLY).
4. In the event that the operator decides to revert to using conventional diesel or CARB diesel fuel, the operator shall comply with the in-use operation requirements of 13 CCR, §2477, subsection (e)(1) within 10 days of discontinuation of alternative diesel fuel use. Within 10 days of discontinuation, the operator shall notify the Executive Officer in writing of this change in fuel use and shall update the ARB Identification Number compliance status in the ARB Equipment Registration (ARBER) Program.

Subsection (f)(1)(B) lists the recordkeeping and reporting requirements for alternative diesel fuel:

1. Operators that choose a compliance pathway that involves the use of GTL100 fuel in accordance with subparagraph (e)(1)(A)3.d. shall maintain records that document exclusive use of GTL100 and the hours of operation for each affected engine. Appropriate records would be copies of receipts or invoices of fuel purchases, fuel records for each unit, and daily operating hour logs for each unit.
2. Records shall be kept available for a minimum of three (3) years and shall be compiled and made available to the ARB upon request.
3. Failure to keep records or submittal of false information is a violation of state law subject to civil penalty.

What are some of the issues related to using GTL100 fuel?

Is GTL100 fuel verified as a VDECS?
Not at this time. GTL100 cannot be used as a TRU ATCM compliance option until it is verified as a VDECS. Alternative diesel fuels must be verified as a VDECS before they can be used to comply with the TRU ATCM's in-use performance standards. Verification of GTL100 fuel must be done in accordance with 13 CCR, section 2710. Subsection (f) requires a multimedia assessment (MMA) of any alternative diesel fuel to be conducted prior to verification. Before an alternative diesel fuel may be verified the California Environmental Policy Council (EPC) must determine that use of the fuel will not cause a significant adverse impact on the public health or the environment.

To date, no GTL producer has applied for verification or requested an MMA. To qualify for verification a VDECS must reduce particulate matter by at least 25 percent. Currently, only one GTL100 fuel formulation is known at this time to meet this criteria.

Why would ARB allow GTL100 fuel for compliance with the TRU ATCM?
The use of GTL100 fuel (pure GTL fuel with no conventional diesel fuel) reduces PM emissions, but these reductions alone would not meet LETRU (50 percent PM reduction) and certainly don't meet ULETRU (85 percent PM reduction). However, ARB expects the PM emissions from an engine that is fueled with GTL100 to be much less toxic. Once GTL100 goes through MMA, the toxicity issue will be clearer and if GTL100 is verified as a VDECS, then it may provide another compliance option.

Is GTL fuel readily available?
At this time there are limited supplies of GTL100. This may change once GTL fuel is verified.

How much contamination with conventional diesel fuel is allowed?
With very narrow exceptions, conventional diesel fuel can not be used in an Alternative Technology to achieve compliance with the TRU ATCM. However, ARB allows very small

quantities of conventional diesel contamination. The amount of conventional diesel in the resulting blend must be insignificant compared to the amount of pure biodiesel.

Are nitrogen oxide emissions a concern with GTL use?

No. Some emissions test data show that nitrogen oxide (NOx) emissions may be reduced with GTL100 fuel compared with conventional diesel.

Are there any operational concerns related to switching to GTL fuel?

Fleets that are interested in GTL fuel should be aware that GTL fuel may have some operational concerns, some of which may be evaluated as part of the verification process. Some potential issues to be aware of are described below:

1. The most common issue is the gelling of GTL100 fuel in cold weather. As temperatures decrease, GTL100 fuel's cold flow properties begin to be problematic sooner compared to conventional diesel. Operators may need to heat and/or insulate fuel lines, filters, on-board fuel tanks, dispensing equipment, and above-ground storage tanks.
2. Because GTL fuel is an ultra-low aromatic hydrocarbon fuel, hoses and seals may swell and soften with GTL100 fuel use and may need to be changed to materials that are more compatible with GTL fuel.
3. Because GTL fuel has ultra-low sulfur content, algae growth may be an issue that shortens its shelf-life compared to conventional diesel. Contact the GTL fuel supplier on the appropriate storage methods, conditions, storage time and if additives are recommended. Operators should size storage tanks appropriately and avoid overstocking so that tank turn intervals are not excessive. Similarly, a TRU that is fueled with GTL100 fuel and sits idle for long durations may have algae growth and filter clogging issues at start-up.

For more information

To obtain a copy of the regulation or other related compliance assistance documents, visit the TRU website at http://www.arb.ca.gov/diesel/tru.htm. Additional questions may be addressed by calling the toll-free TRU Help Line at 1-888-878-2826 (1-888-TRU-ATCM).

If you have a disability-related accommodation need, please go to http://www.arb.ca.gov/html/ada/ada.htm for assistance or contact the ADA Coordinator at (916) 323-4916. If you are a person who needs assistance in a language other than English, please contact the Bilingual Coordinator at (916) 323-7053.

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